

## **IN THE CLAIMS**

Please amend claims 1, 16, 24, 32, 33, 41, 53, 58, and 66 as follows:

1. (Currently amended) A chemical protective covering, comprising:  
a laminate that is a composite of a sulfonated aromatic polymer,  
wherein the polymer comprises at least one repeating aromatic group  
selected from 5, 6, or 7 membered single or fused rings having 0, 1, or 2, 3,  
or 4 heteroatoms selected from N, O or S, and at least a portion of the  
aromatic groups having at least one pendant group comprising a sulfonic  
acid, or its salt, that further comprise at least one linkage selected from the  
group consisting of ketone, sulfone, ether and sulfide,  
wherein the polymer has a sulfonic acid equivalent weight of about 400-  
800 (IEC: 1.25-2.5 meq/g), and  
at least one expanded polytetrafluoroethylene (ePTFE) membrane  
laminated to the the sulfonated aromatic polymer,  
wherein the laminate has a moisture vapor transmission rate of greater  
than or equal to about 600 g/m<sup>2</sup>/day and has a permeation to bis-2-  
chloroethyl sulfide of less than or equal to 100 µg/cm<sup>2</sup> over a 20 hour period.
2. (Original) The chemical protective covering of claim 1, wherein the covering  
is an article of apparel or enclosure.
3. (Original) The chemical protective covering of claim 2, wherein the article of  
apparel or enclosure is selected from outer wear, under wear, jackets, pants,  
gloves, foot wear, and hoods.
4. (Original) The chemical protective covering of claim 2, wherein the enclosure  
is selected from tents, sleeping bags, casualty bags, and shelters.
5. (Previously presented) The chemical protective covering of claim 1 wherein  
the protective covering comprises at least one additional layer selected from  
fabric, membrane and film.

6. (Previously presented) The chemical protective covering of claim 1, wherein the protective covering comprises at least one additional layer selected from knit, woven or non-woven apparel fabrics comprising synthetic or natural fibers of polymers selected from poly(aliphatic amide), poly(aromatic amide), polyester, polyolefin, wool, cellulose based fibers, modified cellulose, polyurethane, acrylics, modacrylics, and a blend thereof.
7. (Canceled)
8. (Original) The chemical protective covering of claim 1 having a moisture vapor transmission rate of greater than or equal to about 2000 g/m<sup>2</sup>/day.
9. (Canceled)
10. (Previously presented) The chemical protective covering of claim 1, having a permeation to bis-2-chloroethyl sulfide of less than or equal to 30 µg/cm<sup>2</sup> over a 20 hour period.
11. (Previously presented) The chemical protective covering of claim 1, having a permeation to bis-2-chloroethyl sulfide of less than or equal to 10 µg/cm<sup>2</sup> over a 20 hour period.
12. (Previously presented) The chemical protective covering of claim 1, having a permeation to pinacolyl methylphosphono fluoridate of less than or equal to 30 µg/cm<sup>2</sup> over a 20 hour period.
13. (Previously presented) The chemical protective covering of claim 1, having a permeation to pinacolyl methylphosphono fluoridate of less than or equal to 10 µg/cm<sup>2</sup> over a 20 hour period.
14. (Previously presented) The chemical protective covering of claim 1, having a permeation to pinacolyl methylphosphono fluoridate of less than or equal to 5 µg/cm<sup>2</sup> over a 20 hour period.
15. (Canceled)

16. (Currently amended) The chemical protective covering of claim 1 wherein at least a portion of the aromatic groups having at least one pendant sulfonic acid, or its salt, are linked by one or more linkages selected from the group consisting of ~~comprising~~ ketone, sulfone, and ether, ~~sulfide, urethane, amide, imide, ester, substituted or unsubstituted saturated or unsaturated C<sub>4-5</sub> alkylene, substituted or unsubstituted phosphine, and phosphine oxide~~ groups.
17. (Original) The chemical protective covering of claim 1 wherein at least a portion of the aromatic groups have one or more substitutions selected from C<sub>1</sub>-C<sub>8</sub> alkyl and haloalkyl, aryl, ketone, hydroxyl, halogen, amine, cyanide, nitrile, sulfide, carbonyl, C<sub>1</sub>-C<sub>8</sub> ester, and C<sub>1</sub>-C<sub>8</sub> alkoxyl group.
18. (Original) The chemical protective covering of claim 1, wherein the sulfonated aromatic polymer is crosslinked.
19. (Original) The chemical protective covering of claim 1, wherein the sulfonated aromatic polymer is ionically crosslinked.
- 20 – 23 (Canceled)
24. (Currently amended) A chemical protective article of apparel or enclosure for use in reducing exposure to chemicals, comprising:
  - a fabric laminate capable of transmitting water vapor,  
consisting essentially of at least one layer of apparel fabric selected from knit, woven or non-woven apparel fabrics laminated to
  - a sulfonated aromatic polymer, wherein the polymer comprises at least one repeating aromatic group selected from 5, 6, or 7 membered single or fused rings having 0, 1, or 2, ~~3, or~~ 4 heteroatoms selected from N, O or S, and at least a portion of the aromatic groups having at least one pendant group comprising a sulfonic acid, or its salt, that further comprise at least one linkage selected from the group consisting of ketone, sulfone, ether and sulfide.

wherein the polymer has a sulfonic acid equivalent weight of about 400-800 (IEC: 1.25-2.5 meq/g), and wherein the fabric laminate has a permeation to bis-2-chloroethyl sulfide of less than or equal to about 100  $\mu\text{g}/\text{cm}^2$  over a 20 hour period.

25. (Previously presented) The chemical protective article of apparel or enclosure of claim 24 wherein the sulfonated aromatic polymer has a permeation to bis-2-chloroethyl sulfide of less than or equal to about 30  $\mu\text{g}/\text{cm}^2$  over a 20 hour period.
26. (Previously presented) The chemical protective article of apparel or enclosure of claim 24 wherein the sulfonated aromatic polymer has a permeation to bis-2-chloroethyl sulfide of less than or equal to about 10  $\mu\text{g}/\text{cm}^2$  over a 20 hour period.
27. (Canceled)
28. (Original) The chemical protective article of apparel or enclosure of claim 24 comprising at least two layers of apparel fabric.
29. (Original) The chemical protective article of apparel or enclosure of claim 24 wherein the at least one layer of apparel fabrics comprises synthetic or natural fibers of polymers selected from poly(aliphatic amide), poly(aromatic amide), polyester, polyolefin, wool, cellulose based fibers, modified cellulose, polyurethane, acrylics, modacrylics, and a blend thereof.
30. (Original) The chemical protective article of apparel or enclosure of claim 24 wherein the article of apparel is selected from outer wear, under wear, jackets, pants, gloves, foot wear, and hoods.
31. (Original) The chemical protective article of apparel or enclosure of claim 24 wherein the enclosure is selected from tents, sleeping bags, casualty bags and structures.

32. (Currently amended) The chemical protective article of apparel or enclosure of claim 24 wherein at least a portion of the aromatic groups having at least one pendant sulfonic acid, or its salt, are linked by one or more linkages selected from the group consisting of ~~comprising~~ ketone, sulfone, and ether, sulfide, urethane, amide, imide, ester, substituted or unsubstituted saturated or unsaturated C<sub>1-5</sub> alkylene, substituted or unsubstituted phosphine, and phosphine oxide groups.
33. (Currently amended) The chemical protective article of apparel or enclosure of claim 24 wherein at least a portion of the aromatic groups are linked by one or more linkages comprising ketone, sulfone, imide and ether.
34. (Original) The chemical protective article of apparel or enclosure of claim 24 wherein at least a portion of the aromatic groups have one or more substitutions selected from C<sub>1</sub>-C<sub>8</sub> alkyl and haloalkyl, aryl, ketone, hydroxyl, halogen, amine, cyanide, nitrile, sulfide, carbonyl, C<sub>1</sub>-C<sub>8</sub> ester and C<sub>1</sub>-C<sub>8</sub> alkoxyl groups.
35. (Canceled)
36. (Previously presented) The chemical protective article of apparel or enclosure of claim 24 wherein the sulfonated aromatic polymer is laminated to at least one substrate.
37. (Previously presented) The chemical protective article of apparel or enclosure of claim 36 wherein the at least one substrate is a porous substrate.
38. (Previously presented) The chemical protective article of apparel or enclosure of claim 36 wherein the at least one substrate is an expanded polytetrafluoroethylene (ePTFE) membrane.
39. (Previously presented) The chemical protective article of apparel or enclosure of claim 38 wherein at least a portion of the sulfonated aromatic

polymer resides partially or fully in the expanded polytetrafluoroethylene (ePTFE) membrane.

40. (Previously presented) The chemical protective article of apparel or enclosure of claim 38 wherein the layer having the sulfonated aromatic polymer is a composite comprising the sulfonated aromatic polymer and at least two substrates.
41. (Currently amended) A chemical protective article of apparel or enclosure for use in reducing exposure of a person to harmful chemicals comprising a fabric laminate capable of transmitting moisture vapor and resisting permeation by harmful chemicals, comprising:
  - at least one layer of apparel fabric selected from knit, woven and non-woven apparel fabrics laminated to
  - a composite consisting essentially of a sulfonated aromatic polymer, the sulfonated aromatic polymer comprising repeat units selected from sulfonated polyether sulfone, sulfonated polyether ketone, sulfonated biphenyl sulfone, sulfonated polyphthalazinone ether ketone, ~~sulfonated polyimide, sulfonated polybenzimidazole,~~ and sulfonated polyphenylene oxide, wherein the sulfonated aromatic polymer has a sulfonic acid equivalent weight of about 400-800 (IEC: 1.25-2.5 meq/g), between
  - two expanded microporous polytetrafluoroethylene membranes
  - wherein the fabric laminate has a permeation to bis-2-chloroethyl sulfide of less than or equal to about  $100 \mu\text{g}/\text{cm}^2$  over a 20 hour period.
42. (Canceled)
43. (Original) The chemical protective article of apparel or enclosure of claim 41 wherein the at least one layer of apparel fabric comprises synthetic or natural fibers of polymers selected from poly(aliphatic amide), poly(aromatic amide), polyester, polyolefin, wool, cellulose based fibers, modified cellulose, polyurethane, acrylics, modacrylics, and a blend thereof.
44. (Original) The chemical protective article of apparel or enclosure of claim 41 comprising at least two layers of apparel fabric.

45. (Original) The chemical protective article of apparel of claim 41 wherein the fabric laminate is waterproof.
46. (Original) The chemical protective article of apparel or enclosure of claim 41 wherein the fabric laminate is an article of apparel selected from outer wear, under wear, jackets, pants, gloves, foot wears, and hoods.
47. (Original) The chemical protective article of apparel or enclosure of claim 41 wherein the fabric laminate has a permeation to bis-2-chloroethyl sulfide of less than or equal to about  $30 \mu\text{g}/\text{cm}^2$  over a 20 hour period.

48 – 52 (Canceled)

53. (Currently amended) A method of reducing exposure of a person to chemicals, comprising:
  - interposing a chemical protective covering between a person and a noxious or harmful chemical, wherein the chemical protective covering comprises a fabric laminate made by the steps of
    - providing at least one layer of apparel fabric,
    - providing a sulfonated aromatic polymer between two porous or microporous substrates to reside in at least a portion of the pores of the porous or microporous substrates, wherein the sulfonated aromatic polymer comprises at least one repeating aromatic group selected from 5, 6, or 7 membered single or fused rings having 0, 1, or 2, 3, or 4 heteroatoms selected from N, O or S, and at least a portion of the aromatic groups having at least one pendant group comprising a sulfonic acid, or its salt, that further comprise at least one linkage selected from the group consisting of ketone, sulfone, ether and sulfide,
  - wherein the sulfonated aromatic polymer has a sulfonic acid equivalent weight of about 400-800 (IEC: 1.25-2.5 meq/g), and
  - laminating the at least one layer of apparel fabric to at least one of the two porous or microporous substrates on a side opposite the sulfonated aromatic polymer,

wherein the fabric laminate has a permeation to bis-2-chloroethyl sulfide of less than or equal to about  $100 \mu\text{g}/\text{cm}^2$  over a 20 hour period.

54. (Original) The method of claim 53 wherein the chemical protective covering is an article of apparel or enclosure.
55. (Original) The method of claim 53 wherein the chemical protective covering is an article of apparel.
56. (Canceled)
57. (Original) The method of claim 53 wherein the fabric laminate has a permeation to bis-2-chloroethyl sulfide of less than or equal to about  $30 \mu\text{g}/\text{cm}^2$  over a 20 hour period.
58. (Currently amended) The method of claim 53 wherein the sulfonated aromatic polymer has repeat units selected from sulfonated polyether sulfone, sulfonated polyether ketone, sulfonated biphenyl sulfone, sulfonated polyphthalazinone ether ketone, ~~sulfonated polyimide, sulfonated polybenzimidazole,~~ and sulfonated polyphenylene oxide.
59. (Original) The method of claim 53 wherein the sulfonated aromatic polymer comprises a blend of sulfonated and non-sulfonated polymers.
60. (Canceled)
61. (Previously presented) The method of claim 53 wherein the two porous or microporous substrates are selected from porous polytetrafluoroethylene (expanded PTFE), polyurethane, polyamides, polyimides, polysulfones, and polyolefins.
62. (Previously presented) The method of claim 61 wherein at least one substrate is expanded polytetrafluoroethylene (ePTFE).



63. (Previously presented) The method of claim 53 wherein the two substrates are expanded polytetrafluoroethylene (ePTFE).
64. (Original) The method of claim 53 comprising at least two layers of apparel fabric.
65. (Original) The method of claim 53 comprising covering at least a portion of a person who may be exposed to a harmful chemical with a chemical protective article of apparel having a fabric laminate comprising a layer having a sulfonated aromatic polymer with a sulfonic acid equivalent weight of about 400-800 (IEC: 1.25 – 2.5 meq/g), wherein the fabric laminate has a permeation to bis-2-chloroethyl sulfide of less than or equal to about 30  $\mu\text{g}/\text{cm}^2$  over a 20 hour period.
66. (Currently amended) A chemical protective covering, comprising:  
a laminate that is a composite of a sulfonated aromatic polymer,  
~~wherein the polymer comprises at least one repeating aromatic group selected from 5, 6, or 7 membered single or fused rings having 0, 1, or 2, 3, or, 4 heteroatoms selected from N, O or S, and at least a portion of the aromatic groups having at least one pendant group comprising a sulfonic acid, or its salt, wherein the polymer~~  
that has a sulfonic acid equivalent weight of about 400-800 (IEC: 1.25-2.5 meq/g), and consists essentially of sulfonated polyethersulfone, sulfonated polyetherether ketone, sulfonated polyphthalazinone ether ketone, or blends thereof, and  
at least one additional layer selected from a layer of apparel fabric or a porous or microporous substrate, laminated to the layer comprising the sulfonated aromatic polymer,  
wherein the laminate is capable of transmitting moisture vapor and has a permeation to pinacolyl methylphosphono fluoridate of less than or equal to 30  $\mu\text{g}/\text{cm}^2$  over a 20 hour period.
67. (Previously presented) The chemical protective covering of claim 66, further comprising a permeation to pinacolyl methylphosphono fluoridate of less than or equal to 10  $\mu\text{g}/\text{cm}^2$  over a 20 hour period.

68. (Previously presented) The chemical protective covering of claim 66, further comprising a permeation to pinacolyl methylphosphono fluoride of less than or equal to  $5 \mu\text{g}/\text{cm}^2$  over a 20 hour period.